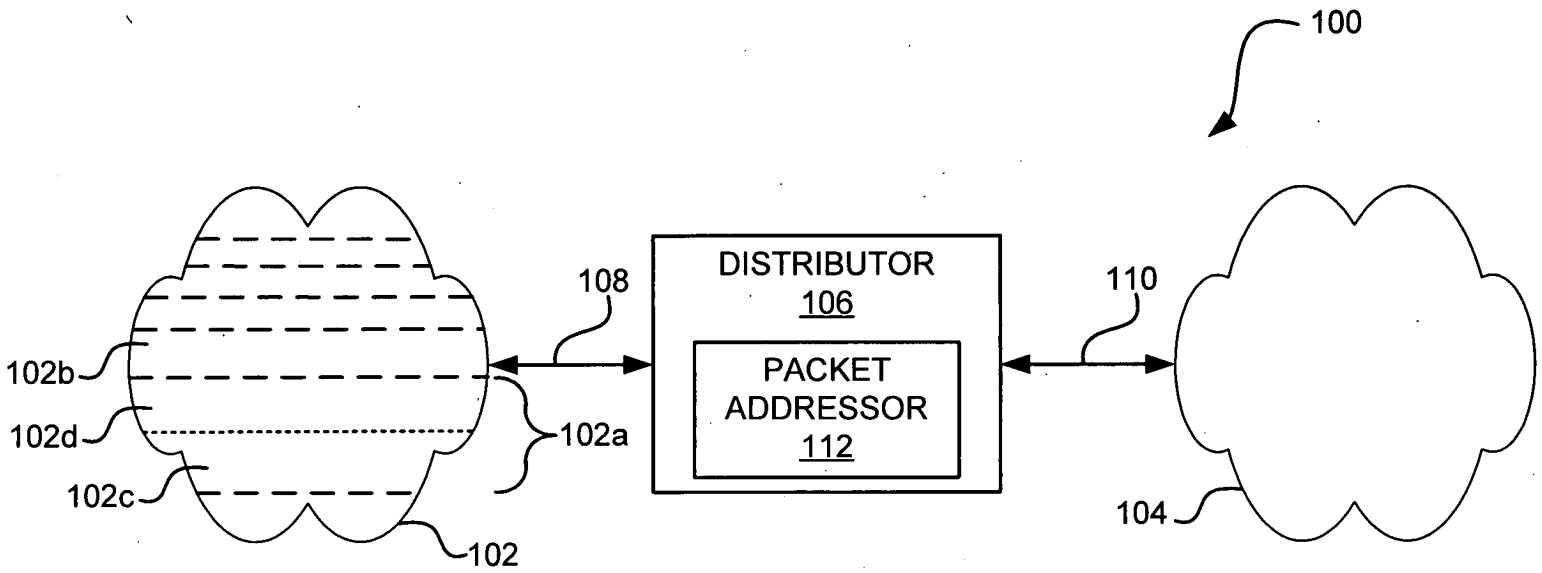

100
DISTRIBUTOR
106
PACKET
ADDRESSOR
112
108
110
102b
102d
102c
102a
102
104

FIGURE 1

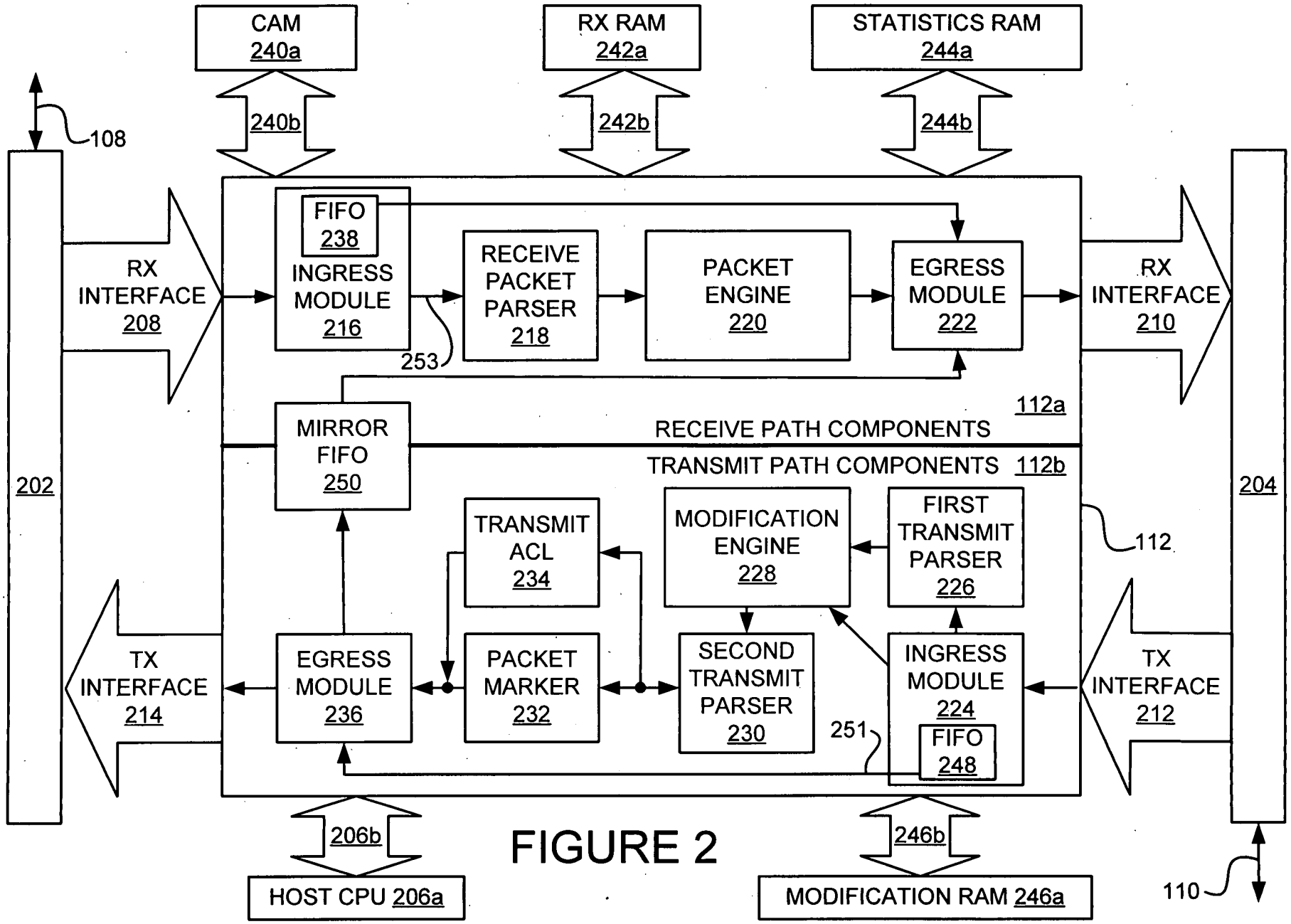
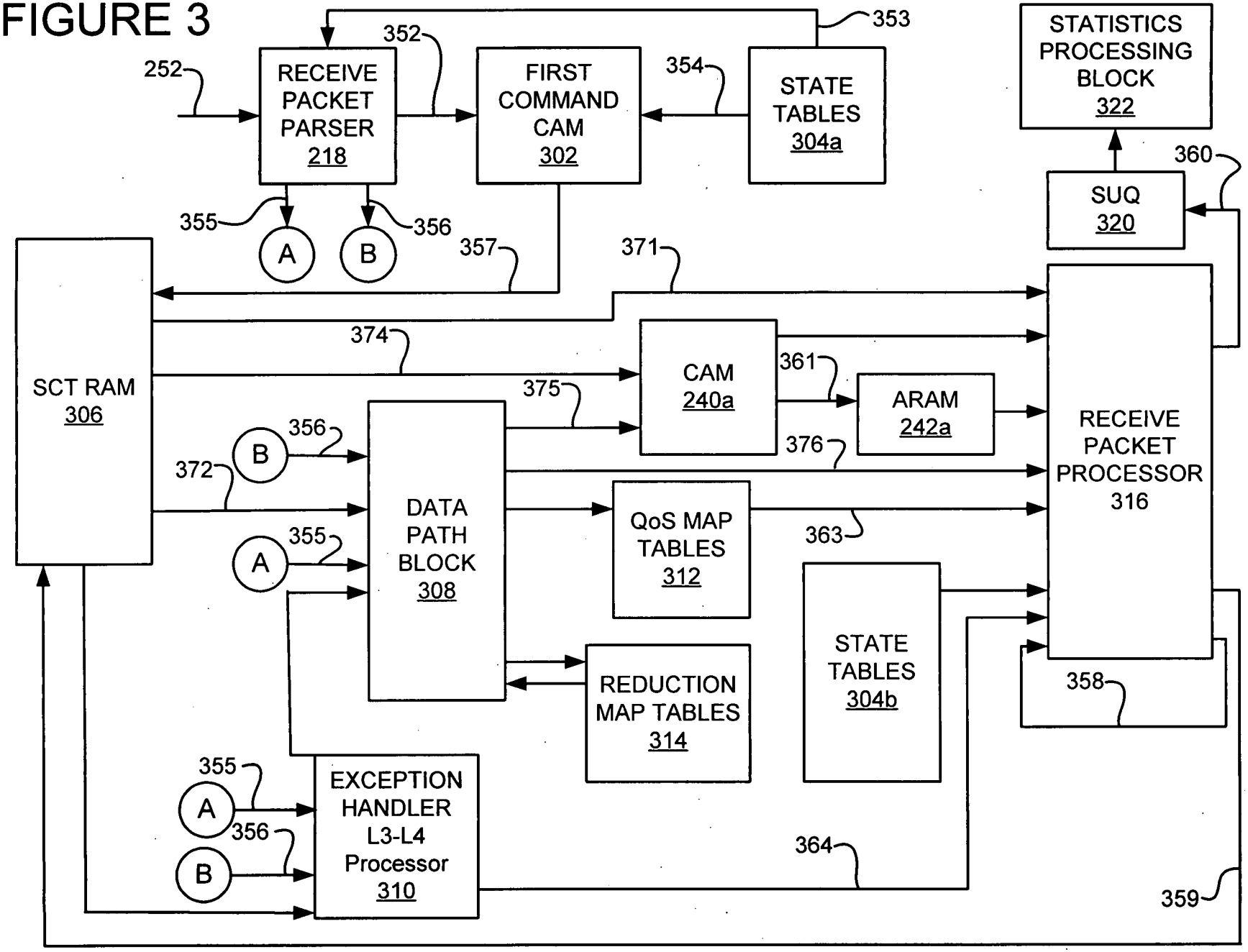

CAM
240a
RX RAM
242a
STATISTICS RAM
244a
240b
242b
244b
108
FIFO
238
INGRESS
MODULE
216
RECEIVE
PACKET
PARSER
218
PACKET
ENGINE
220
EGRESS
MODULE
222
RX
INTERFACE
208
RX
INTERFACE
210
253
112a
RECEIVE PATH COMPONENTS
MIRROR
FIFO
250
TRANSMIT PATH COMPONENTS 112b
202
204
TRANSMIT
ACL
234
MODIFICATION
ENGINE
228
FIRST
TRANSMIT
PARSER
226
112
TX
INTERFACE
214
EGRESS
MODULE
236
PACKET
MARKER
232
SECOND
TRANSMIT
PARSER
230
INGRESS
MODULE
224
FIFO
248
251
TX
INTERFACE
212
206b
246b
HOST CPU 206a
MODIFICATION RAM 246a
110

FIGURE 2

FIGURE 3


252
RECEIVE PACKET PARSER 218
352
FIRST COMMAND CAM 302
354
STATE TABLES 304a
353
STATISTICS PROCESSING BLOCK 322
360
SUQ 320
355
356
A
B
357
371
SCT RAM 306
374
CAM 240a
361
ARAM 242a
375
376
RECEIVE PACKET PROCESSOR 316
372
DATA PATH BLOCK 308
QoS MAP TABLES 312
363
REDUCTION MAP TABLES 314
STATE TABLES 304b
358
EXCEPTION HANDLER L3-L4 Processor 310
364
359

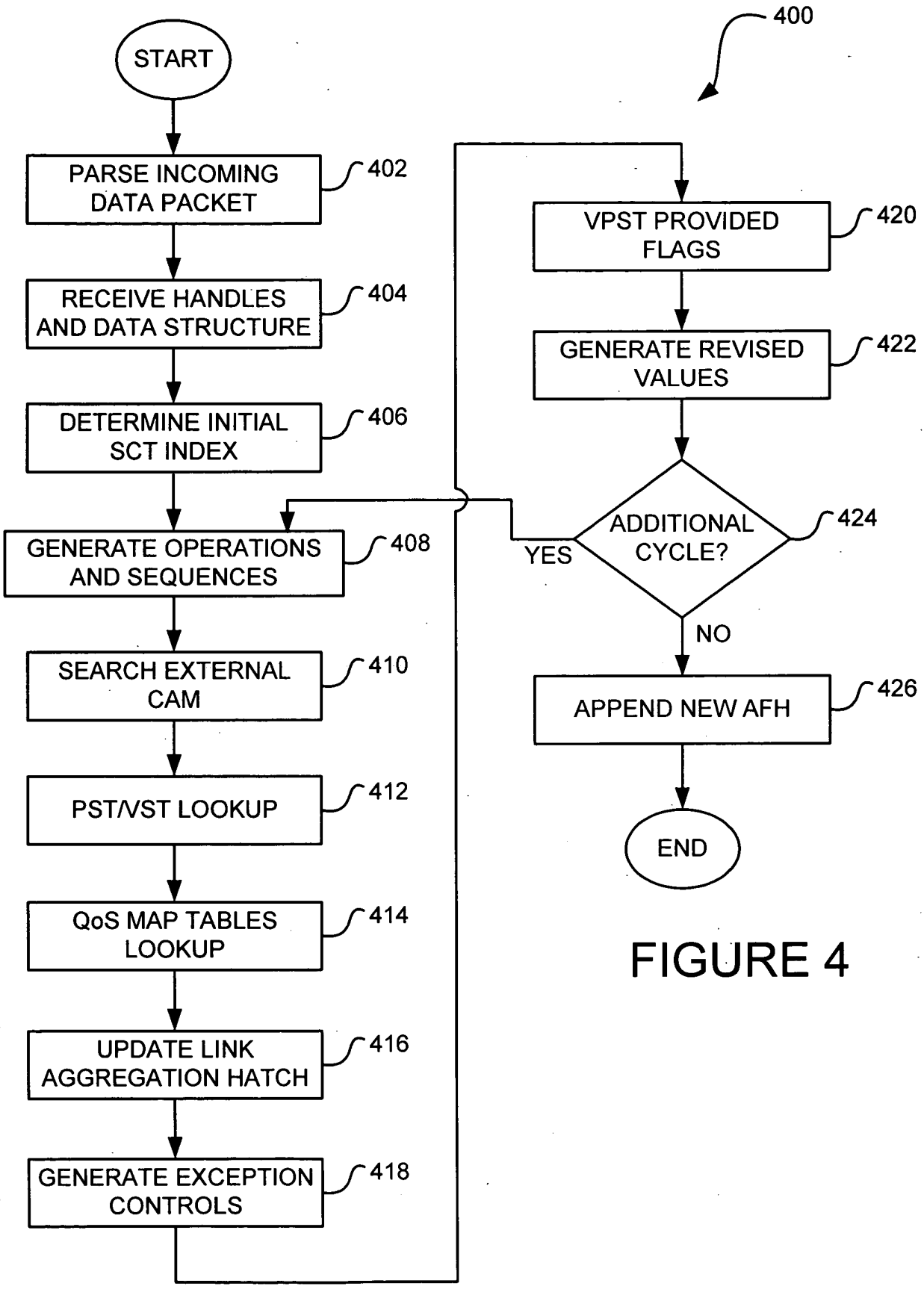

400
START
PARSE INCOMING DATA PACKET
402
RECEIVE HANDLES AND DATA STRUCTURE
404
DETERMINE INITIAL SCT INDEX
406
GENERATE OPERATIONS AND SEQUENCES
408
SEARCH EXTERNAL CAM
410
PST/VST LOOKUP
412
QoS MAP TABLES LOOKUP
414
UPDATE LINK AGGREGATION HATCH
416
GENERATE EXCEPTION CONTROLS
418
VPST PROVIDED FLAGS
420
GENERATE REVISED VALUES
422
ADDITIONAL CYCLE?
424
YES
NO
APPEND NEW AFH
426
END

FIGURE 4

BIT	FUNCTION	DESCRIPTION
15-0	PTI	PORT TAG INDEX.
19-16	EQoS	EGRESS QUEUE SELECT.
23-20	LAI	LINK AGGREGATION INDEX.
24	JUMBO	EGRESS JUMBO CHECK FLAG. REQUESTS OT PERFORMS JUMBO CHECK ON EGRESS PORT.
25	DON'T FRAG	DON'T FRAGMENT FLAG.
26	IF TYPE	INGRESS INTERFACE TYPE. 0 = ETHERNET, 1 = POS INTERFACE.
27	-	RESERVED.
28	ROUTE	ROUTE FLAG. ESSENTIALLY DISABLES ECHO KILL IN DISTRIBUTOR 106.
29	RED	RANDOM EARLY DROP. PACKET MUST BE PROCESSED BY DISTRIBUTOR 106 FOR DROP PRECEDENCE.
31-30	CTL	AFH FORMAT TYPE. SET TO 0 FOR PACKET ADDRESSOR 112 FORMAT TYPE
51-32	TXMI	TRANSMIT MODIFICATION INDEX.
58-52	CQoS	CPU QUEUE SELECT.
59	CPU COPY	CPU COPY FLAG. REQUESTS OT TO SEND A COPY OF THE PACKET TO THE CPU.
60	REDIRECT	REDIRECT FLAG. REQUESTS OT TO SEND A COPY OF THE PACKET TO THE CPU FOR REDIRECT PROCESSING.
61	SSAMPLE	STATISTICAL SAMPLE FLAG. INDICATES TO THE OT THAT PACKET IS A CANDIDATE FOR STATISTICAL SAMPLING AND MUST BE PLACED ON THE MULTICAST QUEUE.
62	LEARN	LEARN FLAG. REQUESTS OT TO SEND A COPY OF THE PACKET TO THE CPU FOR LEARN PROCESSING.
63	EMIRROR	EGRESS MIRROR. REQUESTS OT TO SEND A COPY OF THE PACKET TO THE EGRESS MIRROR PORT.
75-64	IQoS	INGRESS QUEUE SELECT.
78-76	EMRK SEL	EGRESS MARK SELECT. SELECTS ONE OF 8 EGRESS MARK OPERATIONS.
81-79	EMRK MASK	EGRESS MARK MASK. SELECTS ONE OF 8 EGRESS MARK MASKS.
82	IMIRROR	INGRESS MIRROR. REQUESTS OT TO SEND A COPY OF THE PACKET TO THE INGRESS MIRROR PORT.
83	PERR KILL	PARITY ERROR KILL. REQUESTS RX EGRESS PBUS INTERFACE TO KILL THE PACKET DUE TO THE DETECTION OF AN ARAM PARITY ERROR.

502

504

500

FIGURE 5

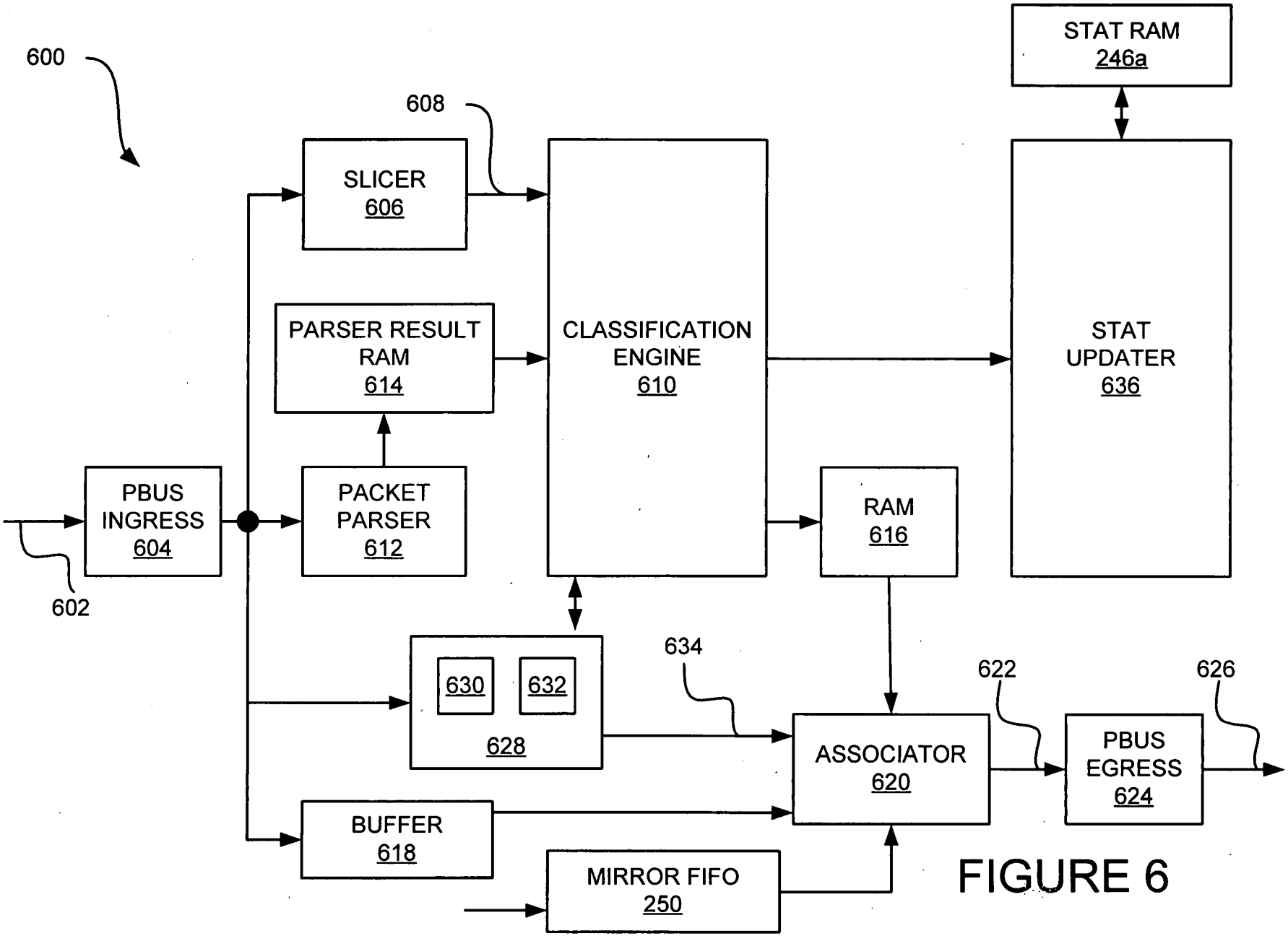

600
608
STAT RAM
246a
SLICER
606
CLASSIFICATION
ENGINE
610
STAT
UPDATER
636
PARSER RESULT
RAM
614
PBUS
INGRESS
604
602
PACKET
PARSER
612
RAM
616
630
632
628
634
622
626
ASSOCIATOR
620
PBUS
EGRESS
624
BUFFER
618
MIRROR FIFO
250

FIGURE 6

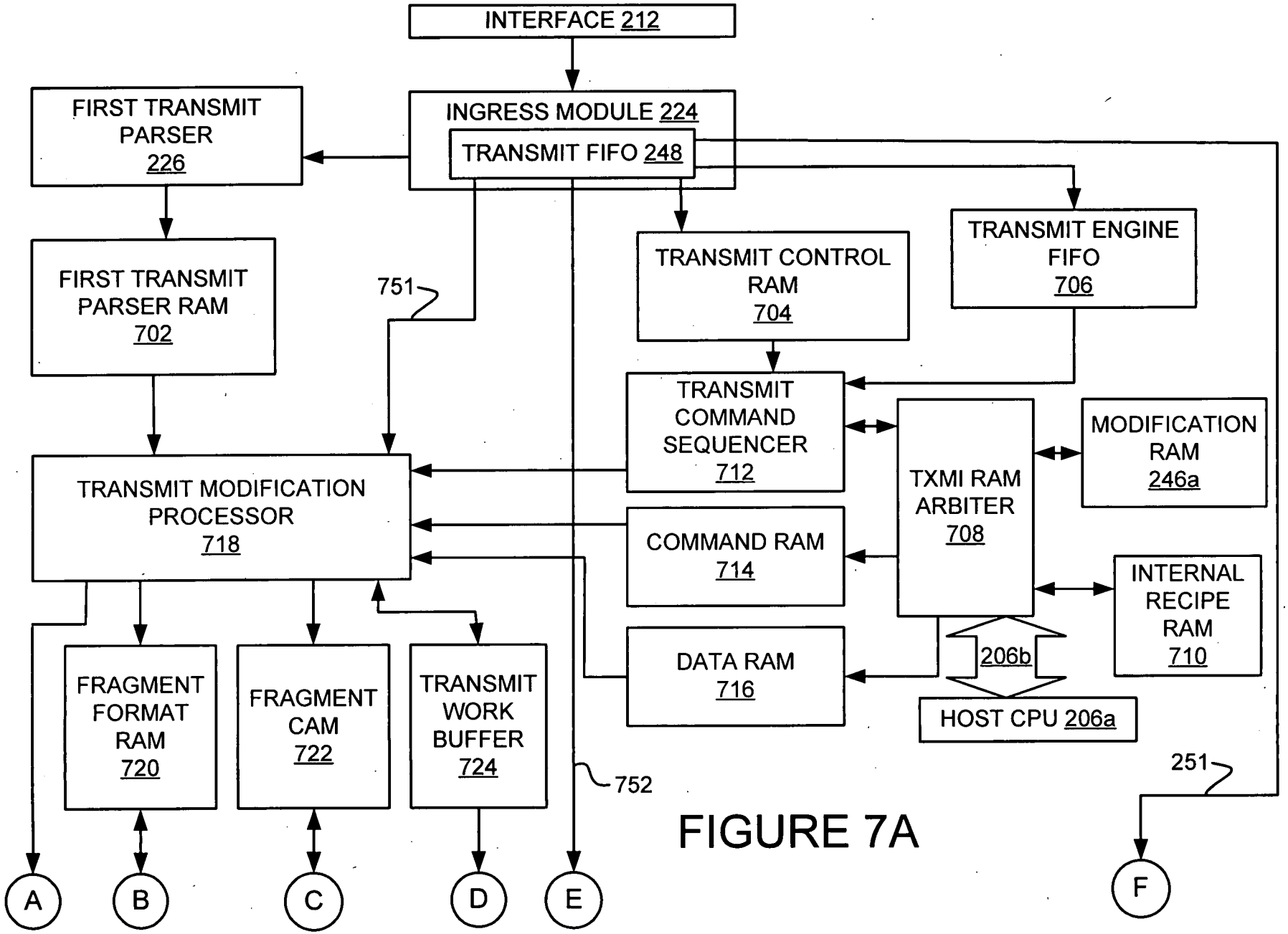

INTERFACE 212
FIRST TRANSMIT PARSER 226
INGRESS MODULE 224
TRANSMIT FIFO 248
FIRST TRANSMIT PARSER RAM 702
751
TRANSMIT CONTROL RAM 704
TRANSMIT ENGINE FIFO 706
TRANSMIT COMMAND SEQUENCER 712
TXMI RAM ARBITER 708
MODIFICATION RAM 246a
TRANSMIT MODIFICATION PROCESSOR 718
COMMAND RAM 714
INTERNAL RECIPE RAM 710
DATA RAM 716
206b
HOST CPU 206a
FRAGMENT FORMAT RAM 720
FRAGMENT CAM 722
TRANSMIT WORK BUFFER 724
752
251
A
B
C
D
E
F

FIGURE 7A

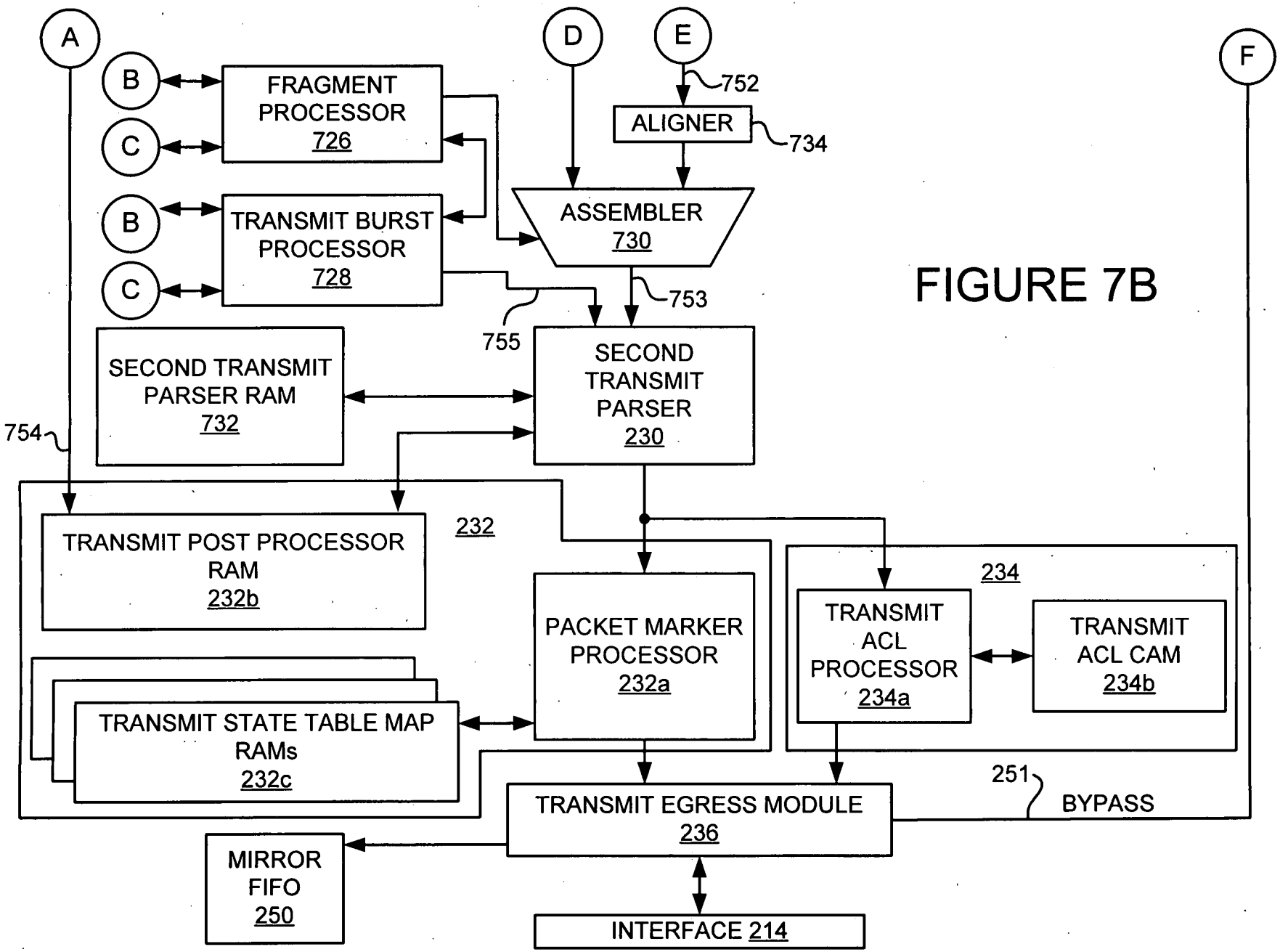

A
B
C
B
C
FRAGMENT PROCESSOR 726
TRANSMIT BURST PROCESSOR 728
D
E
752
ALIGNER
734
ASSEMBLER 730
753
755
F
SECOND TRANSMIT PARSER RAM 732
754
SECOND TRANSMIT PARSER 230
232
TRANSMIT POST PROCESSOR RAM 232b
PACKET MARKER PROCESSOR 232a
234
TRANSMIT ACL PROCESSOR 234a
TRANSMIT ACL CAM 234b
TRANSMIT STATE TABLE MAP RAMs 232c
251
BYPASS
TRANSMIT EGRESS MODULE 236
MIRROR FIFO 250
INTERFACE 214

FIGURE 7B

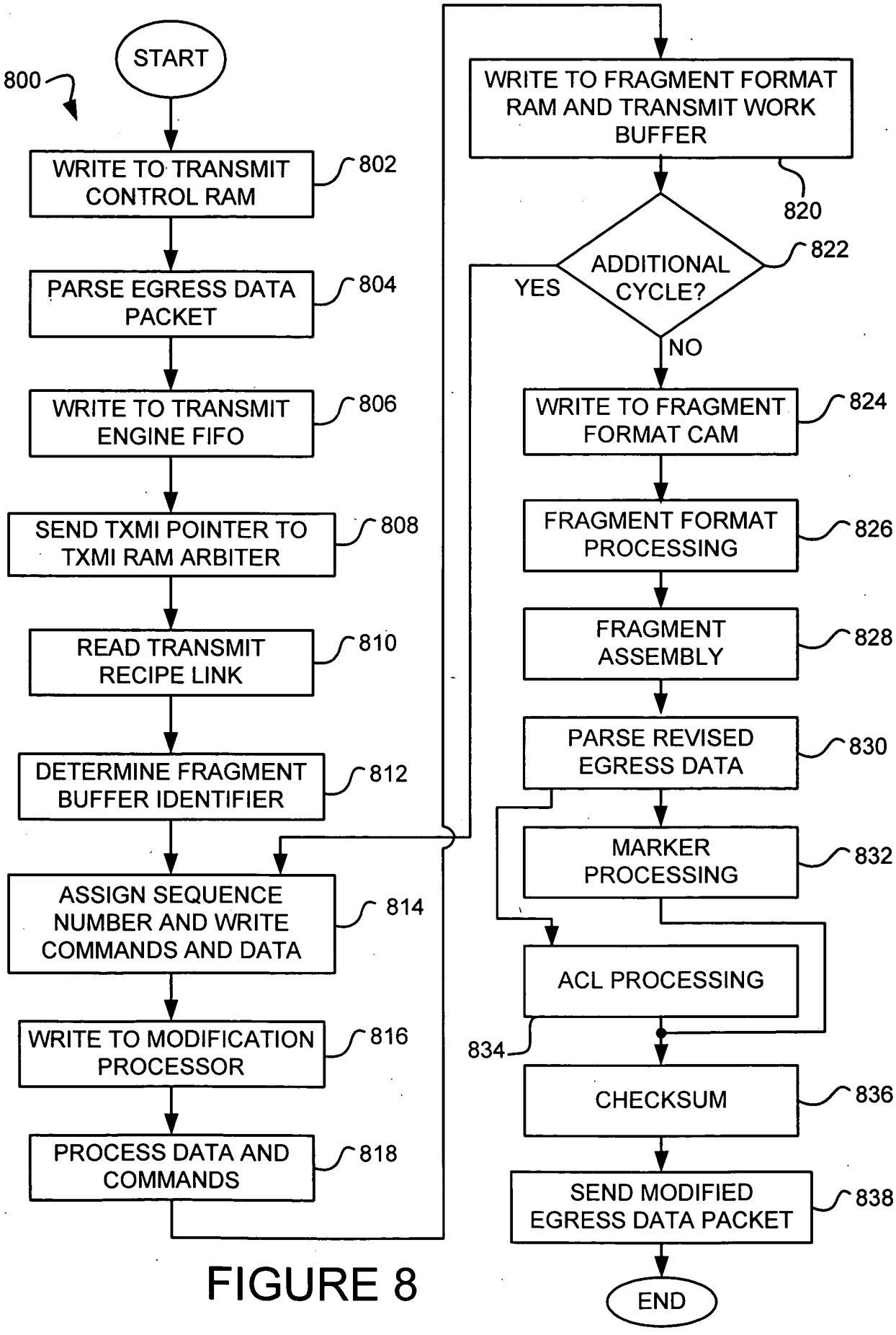

START
800
WRITE TO TRANSMIT CONTROL RAM
802
PARSE EGRESS DATA PACKET
804
WRITE TO TRANSMIT ENGINE FIFO
806
SEND TXMI POINTER TO TXMI RAM ARBITER
808
READ TRANSMIT RECIPE LINK
810
DETERMINE FRAGMENT BUFFER IDENTIFIER
812
ASSIGN SEQUENCE NUMBER AND WRITE COMMANDS AND DATA
814
WRITE TO MODIFICATION PROCESSOR
816
PROCESS DATA AND COMMANDS
818
WRITE TO FRAGMENT FORMAT RAM AND TRANSMIT WORK BUFFER
820
ADDITIONAL CYCLE?
822
YES
NO
WRITE TO FRAGMENT FORMAT CAM
824
FRAGMENT FORMAT PROCESSING
826
FRAGMENT ASSEMBLY
828
PARSE REVISED EGRESS DATA
830
MARKER PROCESSING
832
ACL PROCESSING
834
CHECKSUM
836
SEND MODIFIED EGRESS DATA PACKET
838
END

FIGURE 8

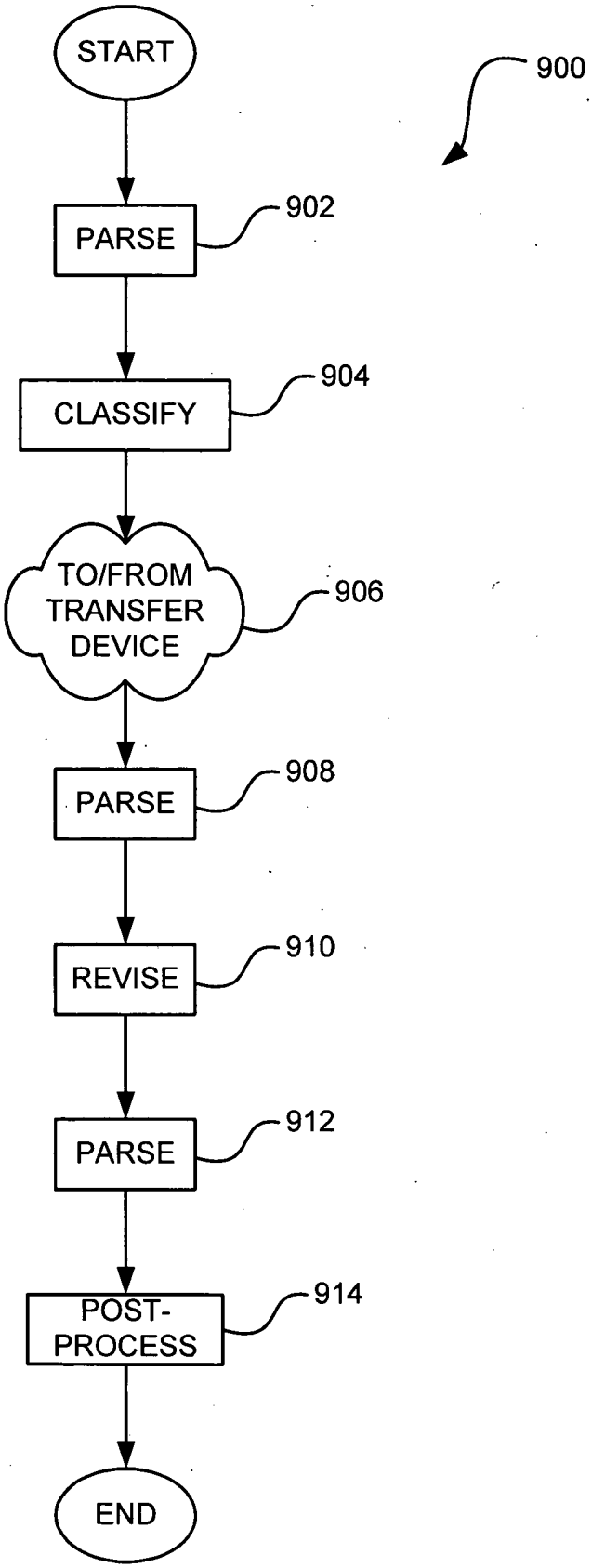

START
900
PARSE
902
CLASSIFY
904
TO/FROM TRANSFER DEVICE
906
PARSE
908
REVISE
910
PARSE
912
POST-PROCESS
914
END

FIGURE 9

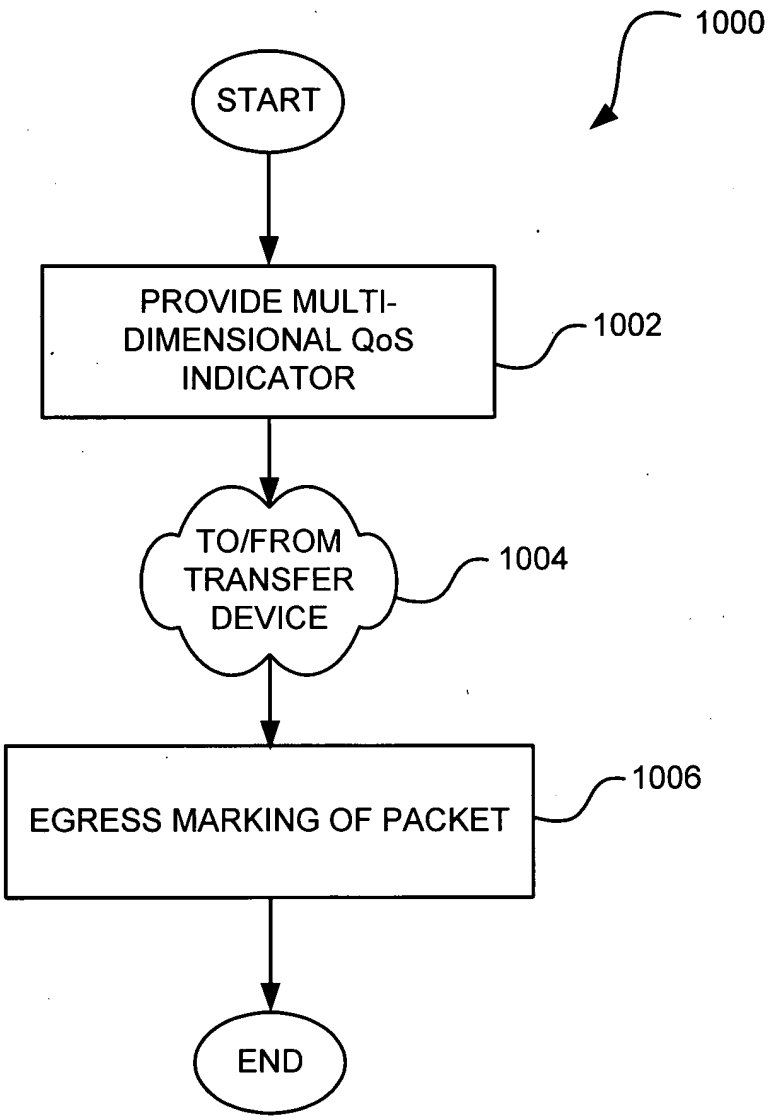

1000
START
PROVIDE MULTI-DIMENSIONAL QoS INDICATOR
1002
TO/FROM TRANSFER DEVICE
1004
EGRESS MARKING OF PACKET
1006
END

FIGURE 10

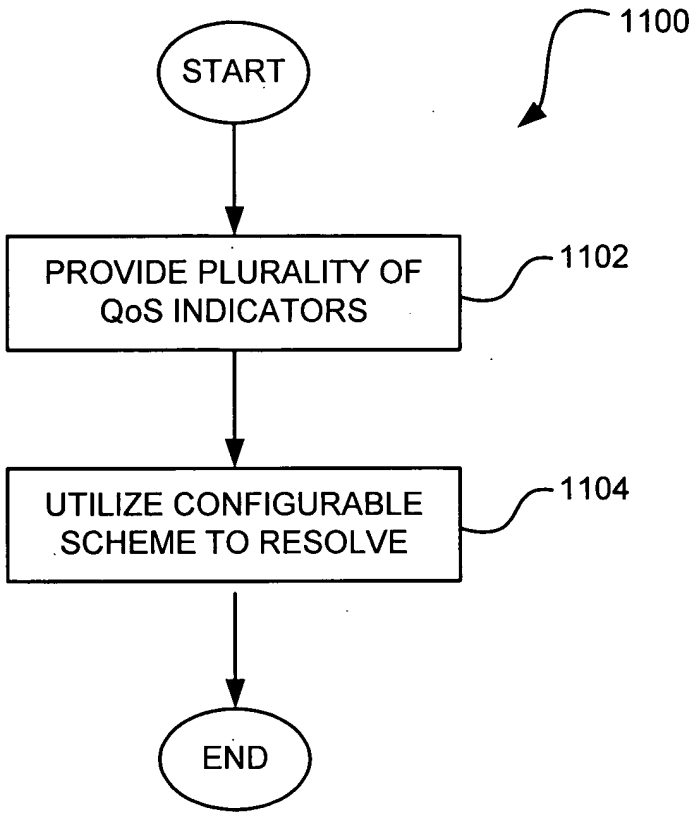

1100
START
PROVIDE PLURALITY OF QoS INDICATORS
1102
UTILIZE CONFIGURABLE SCHEME TO RESOLVE
1104
END

FIGURE 11

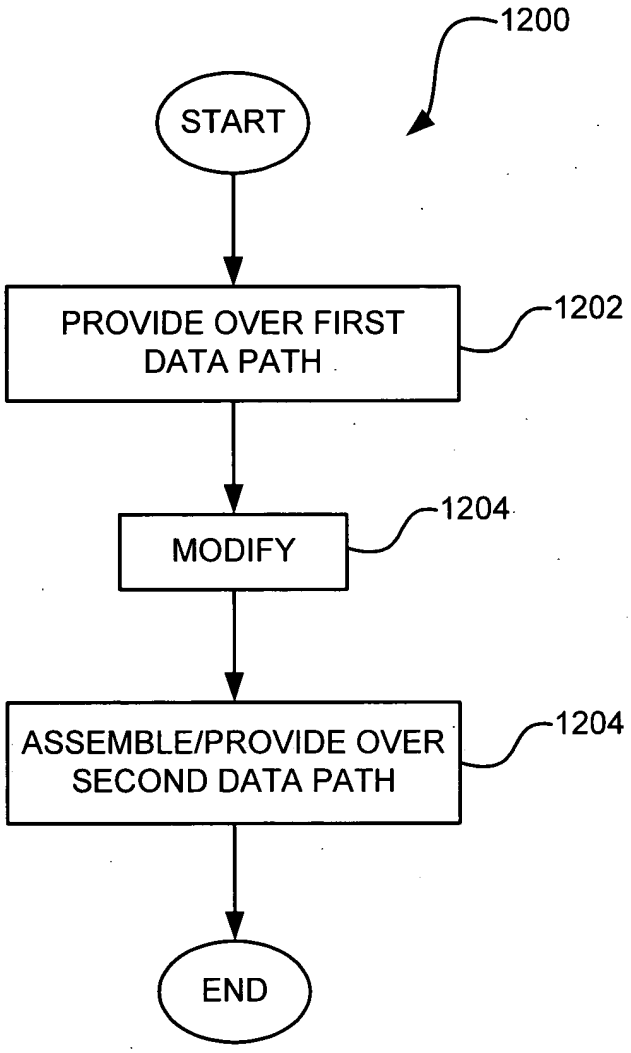

1200
START
PROVIDE OVER FIRST DATA PATH
1202
MODIFY
1204
ASSEMBLE/PROVIDE OVER SECOND DATA PATH
1204
END

FIGURE 12

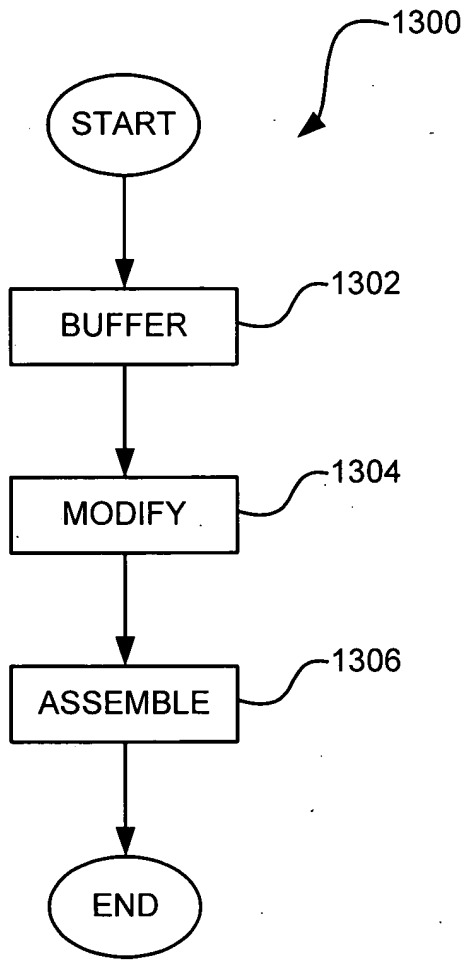


FIGURE 13

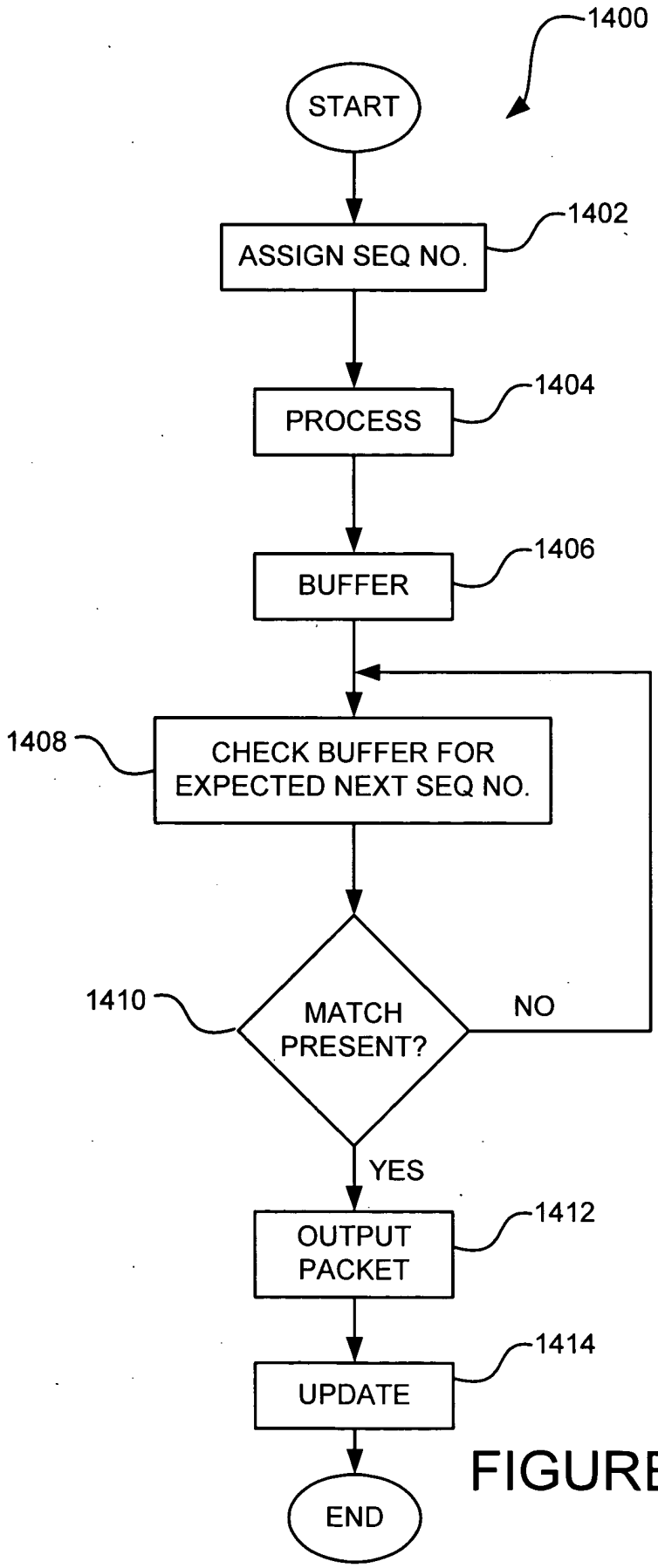

1400
START
1402
ASSIGN SEQ NO.
1404
PROCESS
1406
BUFFER
1408
CHECK BUFFER FOR EXPECTED NEXT SEQ NO.
1410
MATCH PRESENT?
NO
YES
1412
OUTPUT PACKET
1414
UPDATE
END

FIGURE 14

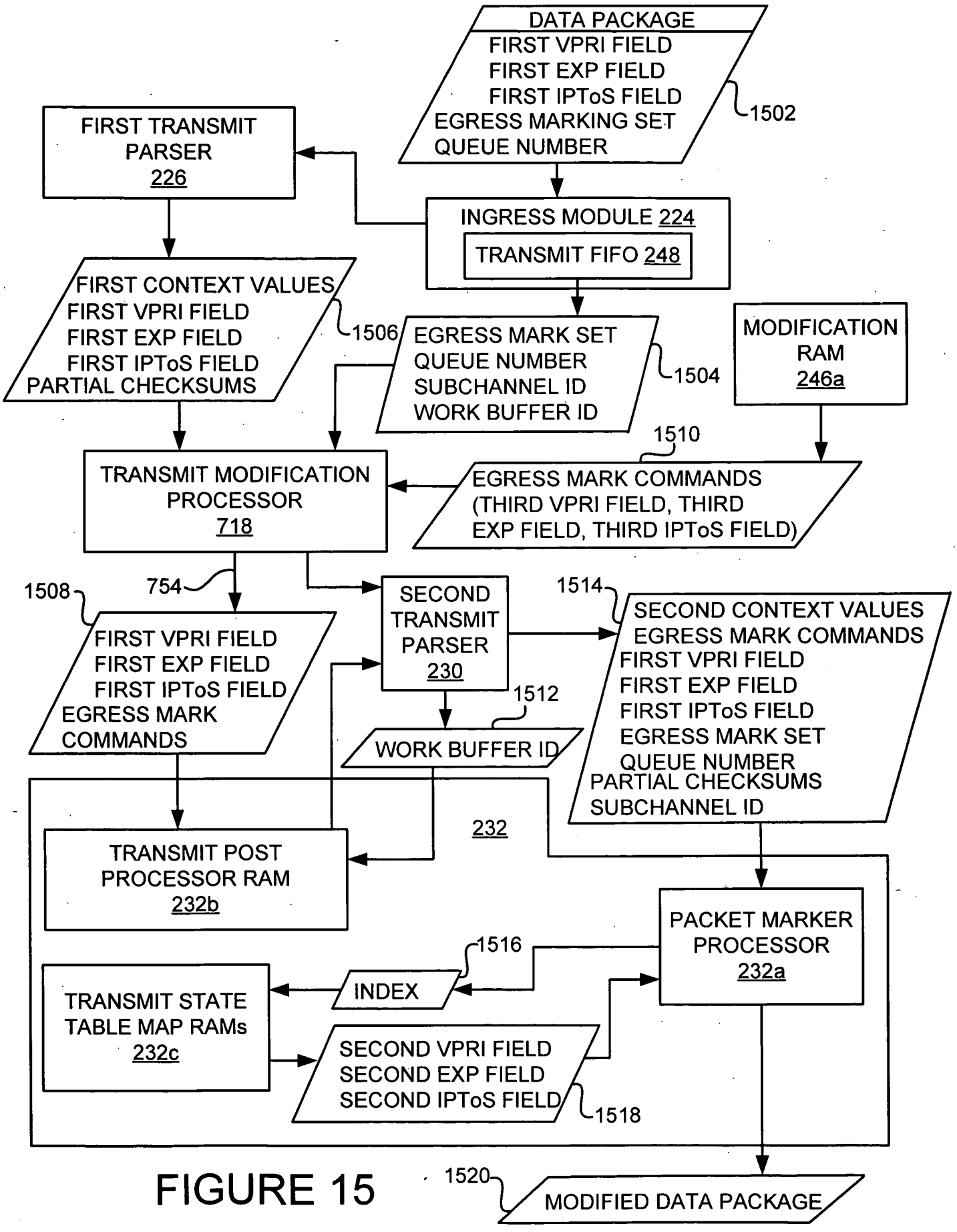

DATA PACKAGE
FIRST VPRI FIELD
FIRST EXP FIELD
FIRST IPToS FIELD
EGRESS MARKING SET
QUEUE NUMBER
1502
FIRST TRANSMIT PARSER 226
INGRESS MODULE 224
TRANSMIT FIFO 248
FIRST CONTEXT VALUES
FIRST VPRI FIELD
FIRST EXP FIELD
FIRST IPToS FIELD
PARTIAL CHECKSUMS
1506
EGRESS MARK SET
QUEUE NUMBER
SUBCHANNEL ID
WORK BUFFER ID
1504
MODIFICATION RAM 246a
1510
TRANSMIT MODIFICATION PROCESSOR 718
EGRESS MARK COMMANDS
(THIRD VPRI FIELD, THIRD
EXP FIELD, THIRD IPToS FIELD)
1508
754
SECOND TRANSMIT PARSER 230
1514
SECOND CONTEXT VALUES
EGRESS MARK COMMANDS
FIRST VPRI FIELD
FIRST EXP FIELD
FIRST IPToS FIELD
EGRESS MARK SET
QUEUE NUMBER
PARTIAL CHECKSUMS
SUBCHANNEL ID
FIRST VPRI FIELD
FIRST EXP FIELD
FIRST IPToS FIELD
EGRESS MARK
COMMANDS
1512
WORK BUFFER ID
232
TRANSMIT POST PROCESSOR RAM 232b
PACKET MARKER PROCESSOR 232a
1516
INDEX
TRANSMIT STATE TABLE MAP RAMs 232c
SECOND VPRI FIELD
SECOND EXP FIELD
SECOND IPToS FIELD
1518
1520
MODIFIED DATA PACKAGE

FIGURE 15